

ABSTRACT

A method and apparatus for stirring a molten thixotropic aluminum alloy comprising a first solid particulate phase suspended in a second liquid phase so as to maintain its thixotropic character by degenerating forming dendritic particles into spheroidal particles while simultaneously equilibrating the melt temperature by quickly transferring heat between the melt and its surroundings. The melt is stirred by a magnetomotive force field generated by a stacked stator assembly. The stacked stator assembly includes a stator ring adapted to generate a linear/longitudinal magnetic field positioned between two stator rings adapted to generate a rotational magnetic field. The stacked stator rings generate a substantially spiral magnetomotive mixing force and define a substantially cylindrical mixing region therein.